

Syllabus

Math 323

Fall '18

Text: *not chosen yet – we shall see after the first week...*

Instructor: Jed Herman Office: SCI D 287 (x4188)
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Office Hours: MTW 1:00 – 1:50, R 5:00-5:50
or by appointment (or whenever I'm in... just stop by!)

Class times & room: MTR 2:00 – 2:50 in Science A225

THIS IS NOT A LECTURE COURSE; YOUR GRADE DOES NOT COME ONLY FROM EXAMS AND HOMEWORK ASSIGNMENTS

This course is going to be taught using Inquiry Based Learning. It is very different from Lecture. Please read the syllabus to understand more about IBL and how the course is graded.

Inquiry Based Learning (IBL):

In the past I have usually taught this course out of a standard textbook. It was fine, though I always supplemented with an end of semester project. In the project, student groups would learn a section of their own (with coaching from me) and present it in a full day of class.

Projects give a real sense of mastery and ownership of the material. Simply put: you learn the material best when you are forced to understand it well enough to explain it to others. A few years ago I took the concept further.

Inquiry Based Learning is active learning. Students do not watch a professor do work – they do it themselves. Doing mathematics is not easy. Your professor can appear to do a problem on the board at 0.1 times the speed of light, but they have spent many, many hours preparing – either specifically for this class, or indirectly over the last ten or twenty years.

Mathematics – real mathematics – is not quick, not easy. But it is *amazing*. It is something you will hopefully experience in this class.

Course Speed:

Your instructor has a reputation for covering a large amount of material during the semester, resulting in a fast pace. This reputation is deserved, but Inquiry Based Learning does not lend itself to speed. We will probably cover less material than “normal” for an introductory Real Analysis course, but in greater depth. If you give this method a chance, you will understand MORE about analytic function theory than if we had used a lecture based method.

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Class Presentation

In most courses, your professor gives you the information, possibly supplemented by a book. In IBL, the students present the information. Professors give the context and direction (and help outside of class), but class time is primarily for student work.

The text we will ultimately use will have definitions. It will also have a few examples (not worked out) and theorems (not proven). YOU will work the examples. YOU will prove the theorems. And you will present them in class.

This can be scary. You might present something you thought was right, only to find out during presentation that it is wrong. That can be uncomfortable and even embarrassing.

It is also NORMAL and GOOD. We learn from doing more than watching. Mistakes teach us – more than correct work does.

In advance, I will assign a list of problems to prepare. At the start of class we will pick presenters for those problems. We may skip some problems that are too easy or too hard, if the class wants to. If a problem is too hard, we may simply defer it until a later day.

When you present, you will write the problem statement on the board, followed by your work. BE SURE TO JUSTIFY EACH STEP (steps like adding +2 to both sides of an equals sign do not need justification). Because the goal is to explain it to everyone, you will need to write out a lot of steps.

When we get to your turn to present, you will explain the steps, being sure to mention the justification if it seems complicated. MAKE SURE TO WAIT FOR QUESTIONS. If you made a mistake, someone will hopefully point it out. You can try to correct it then if you wish.

If you made a mistake or could not do a certain step, you CAN ask for help. This will typically lose you points, but it is sometimes worth it. Being at the board can be intimidating; asking for help occasionally is FINE.

Afterwards, I will photograph your work and post it on D2L. You will also be responsible for writing it up and putting it online.

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Questions:

When someone else is presenting, you should be prepared to ask questions. IT IS PART OF YOUR COURSE GRADE. Try to avoid comments like “the second line is wrong.” Instead, ask “how did you get the second line?” Let the presenter discover the error and fix it if they can. If they fumble and want help, be willing to help but do not simply jump in too much – let them do it as much as they seem able to.

The course is about presentation, but it is ALSO about making a community. The professor is not going to be the final authority – YOU ARE, as a class. If you do not understand a step, ASK. It may be a perfectly reasonable step, but you need to understand it, too.

If somebody presents something wrong, it needs to be discovered – UNDISCOVERED MISTAKES OFTEN MAKE FOR GOOD EXAM QUESTIONS!

The professor will also ask questions – every presentation should have at least one question, either from the class or from the professor. Be prepared to explain and justify your steps.

Open-ended questions and comments are also good. Maybe a problem about functions on the board leads to a question about whether something is true for all functions. This question is very useful for the course and thus encouraged. It may lead to problems beyond the suggested ones, which can be very interesting.

Calculators and Computers: A fancy calculator is not truly necessary for this course, as we will emphasize proofs and methods over brute computation. On the other hand, the TI-series calculators have (limited) text memory capability. *Note cards will not be allowed on exams*, but calculators (and any notes stored in them) will be allowed.

You will be responsible for knowing how to properly use your calculator. Calculators with QWERTY-style keyboards, such as the TI-92, and calculators with symbolic capabilities, such as the TI-89, will not be allowed without special permission.

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Assessment:

This course is challenging, so it will be graded according to the following scale:

87%+ A- or better	77%-86.9% B-, B or B+
67%-76.9% C-, C or C+	57%-66.9% D-, D or D+
<57% F	

I reserve the right to adjust the final percentage +/- up to about 2%, based on my assessment of your effort and/or participation in the class and course in general.

To get your overall score, you will be graded on the following:

Homework	10%
Group Quizzes	10%
Class Presentations and Class Participation	30%
Two in-class exams worth 15% each	30%
Final	<u>20%</u>
Total	100%

Note that 40% of your course grade comes from participation and group quizzes. If you do not present on the board regularly and actively participate in class, your grade will suffer.

Exams:

There will be two exams, plus a cumulative final. The exam times are noted on the schedule. Exam times (not the final time) are subject to change, if the schedule changes.

Group Quizzes

Approximately every other Thursday, we will have group quizzes. Groups of three or four students will write up answers to problems and submit them. Every student in the group will be required to submit at least one answer. You can help each other, but you cannot simply dictate answers. Bonus points will be available for those groups which finish early.

- *Why have group quizzes?* Studies on IBL consistently show that the active components of IBL promote learning, but they also show cooperative learning to have big benefits. Group work, like group quizzes, gives opportunity for cooperative learning situations.
- *I like to work alone!* I understand. It may be hard for you to let someone else do a problem, especially if you consider them a weaker student than you. But it is important not to just do it all yourself. You actually benefit from the experience, even if your blood pressure does not.
- *My grade might suffer because the others in my group aren't as good as me!* **For that reason, grades in this course are about 3% easier to achieve than in most courses. You can consider that 3% an offset for group quizzes, if you like.**

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Class Presentation and Class Participation Grades:

There are several components that will influence this grade. They include the following:

- The *number* and *quality* of your board work. Good board work involves accuracy, clarity, and the ability to answer questions from the class about your work.
- The *number* and *quality* of your questions and comments during class. IBL only thrives when the students take ownership of the assignments; this includes participation when someone else presents.
- The *quality* of your written submissions. Every time you put something on the board you are expected to write it up for a D2L board – especially if it was messy or confusing, or if it underwent several corrections.

Homework:

REAL math is thoughtful, time-consuming, and drawn out. I will want to see MOST problems written up, not just by one presenter, but by everyone. Problems should be written CLEARLY, in an easy-to-follow format.

A great way to write things up is using LaTeX or Microsoft Word with Equation Editor. You can also write it up by hand, if your handwriting is neat enough.

Stumped?

If you are stumped by homework or in-class presentation problems, you have options: 1) you may use the on-line discussion boards to ask other students (or talk to them in person), or 2) you may visit your instructor during office hours (or other times he is available).

AVOID using internet or other external sources, if possible. Instructors for other classes are okay, but they should only give you general help.

DO NOT GIVE FULL ANSWERS TO OTHER STUDENTS IN THE CLASS! The goal is to *learn* to do work, and copying other people's work negates that. Also, if the student is going to present in class, you are doing them a big disservice by working the problem out for them. They will have a very hard time explaining it if they didn't figure it out for themselves.

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D2L:

There are on-line discussion boards available for the course in D2L.

One board will be for peer discussion – that is, questions and answers by students. You can give hints to other students, but please do not write full answers (see Stumped? above).

Another board will be for write-up solutions to in-class presentations.

A third will be for questions for the professor or about the class.

The boards will be monitored after the fact. That is, you will post directly to the board, and I will monitor (at least every other day). Postings are never anonymous and must not contain inappropriate (foul, rude, hostile) language. Violation of this rule may constitute academic misconduct (see below).

Attendance:

Attendance in an IBL course is very important. Even if you do not present, you learn a great deal from the in-class discussion about a problem. Each presentation day you are in class – even if you do not present or ask questions – counts towards your presentation/participation grade.

Missing an exam is allowed only under the most dire of circumstances, and I will require documentation (i.e., a note from your doctor, a copy of the receipt from the tow truck driver, your dad's number so I can call and verify, etc.).

Academic Misconduct Policy

I expect you to complete the coursework for this course. Failure to complete and assignment will result in zero points awarded for that assignment, and possibly a stern look from the instructor. Late assignments may lose points, at the discretion of the instructor. They may also cause your instructor to become grumpy. Also see the following link:

<http://www.uwsp.edu/admin/stuaffairs/rights/rightsChap14.pdf>

Student Rights and Responsibilities

You have certain rights and responsibilities. For more information, see the following link:

<http://www.uwsp.edu/admin/stuaffairs/rights/rightsCommBillRights.pdf>

Tentative Schedule:

Group Quizzes: 9/13, 9/27, 10/11, 11/1, 11/15, 11/29

Review, Exam 1: 10/16, 10/18

Review, Exam 2: 12/4, 12/6

Course Review: 12/13

Final: Monday 12/17 at 10:15 – 12:15

(Thanksgiving is 11/22; there is no class then!)